Name: Date:

Polynomial Factoring solution (version 606)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 21 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(21)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 84}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-80}}{2}$$

$$x = \frac{-2 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-2 \pm 4\sqrt{5}\, i}{2}$$

$$x = -1 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 + 8i$ and $-3 - 9i$ in standard form $(a + bi)$.**

Solution

$$(2 + 8i) \cdot (-3 - 9i)$$

$$-6 - 18i - 24i - 72i^2$$

$$-6 - 18i - 24i + 72$$

$$-6 + 72 - 18i - 24i$$

$$66 - 42i$$

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3. **Write function $f(x) = x^3 + 12x^2 + 47x + 60$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	12	47	60
-5		-5	-35	-60
	1	7	12	0

$$f(x) = (x+5)(x^2+7x+12)$$

$$f(x) = (x+5)(x+4)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+8)^2 \cdot (x+3) \cdot (x-1)^2$$

Sketch a graph of polynomial $y = p(x)$.